

## ABSTRACT

A single surface representation is created from a cloud of points. Each point in the cloud of points is assigned three-dimensional spatial coordinates. The cloud of points is stored in a memory of a computer. Machine-executable instructions are provided for the computer that operate on the cloud of points. The instructions construct an initial triangle  
5 from the cloud of points. The instructions construct a multitude of adjacent triangles forming a single continuous surface representing the object. The triangles comprise planar surfaces having three vertices. The vertices of the adjacent triangles comprise the three points forming the initial triangle and a multitude of other points. Except for the initial two points, the points forming the triangles are each computed as a weighted average of a set of nearby  
10 points in the cloud of points that satisfy selection criteria. The resulting vertex also has to satisfy one or more selection criteria. The final weighted average surface representation requires much less data to represent the object surface than the initial point cloud.